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## Original Research

# Male and female physical intimate partner violence and socio-economic position: a cross-sectional international multicentre study in Europe



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## ABSTRACT

**Objectives:** This work explores the association between socio-economic position (SEP) and intimate partner violence (IPV) considering the perspectives of men and women as victims, perpetrators and as both (bidirectional).

**Study design:** Cross-sectional international multicentre study.

**Methods:** A sample of 3496 men and women, (aged 18–64 years), randomly selected from the general population of residents from six European cities was assessed: Athens; Budapest; London; Östersund; Porto; and Stuttgart. Their education (primary, secondary and university), occupation (upper white collar, lower white collar and blue collar) and unemployment duration (never, ≤12 months and >12 months) were considered as SEP indicators and physical IPV was measured with the Revised Conflict Tactics Scales.

**Results:** Past year physical IPV was declared by 17.7% of women (3.5% victims, 4.2% perpetrators and 10.0% bidirectional) and 19.8% of men (4.1% victims, 3.8% perpetrators and 11.9% bidirectional). Low educational level (primary vs university) was associated with female victimisation (adjusted odds ratio, 95% confidence interval: 3.2; 1.3–8.0) and with female bidirectional IPV (4.1, 2.4–7.1). Blue collar occupation (vs upper white) was associated with female victimisation (2.1, 1.1–4.0), female perpetration (3.0, 1.3–6.8) and female bidirectional IPV (4.0, 2.3–7.0). Unemployment duration was associated with male

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perpetration (>12 months of unemployment vs never unemployed: 3.8; 1.7–8.7) and with bidirectional IPV in both sex (women: 1.8, 1.2–2.7; men: 1.7, 1.0–2.8).

**Conclusions:** In these European centres, physical IPV was associated with a disadvantaged SEP. A consistent socio-economic gradient was observed in female bidirectional involvement, but victims or perpetrators-only presented gender specificities according to levels of education, occupation differentiation and unemployment duration potentially useful for designing interventions.

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## Introduction

Exposure to intimate partner violence (IPV) is greater in more unequal societies.<sup>1</sup> Similarly, from an individual perspective, the more disadvantaged is the socio-economic position (SEP) the more frequently women and men are victims of violence.<sup>2</sup> However, the nature and magnitude of the association between social determinants and violence depends on the type of indicator used.<sup>3,4</sup> Also, it is particularly important to know if similar determinants and pathways operate when considering separately the involved gender and the directionality of violence, taking victims, perpetrators and those that are both victims and perpetrators as different outcomes.

The relation between socio-economic indicators and IPV has been essentially studied considering female victims.<sup>5–8</sup> The World Studies of Abuse in the Family Environment consortium addressed communities from Chile, Egypt, India and the Philippines and showed that a higher educational level protected women from physical assault.<sup>9</sup> In the World Health Organization multicountry study on women's health and domestic violence a protective effect was consistently observed across settings when both the woman and her partner had completed secondary education.<sup>10</sup> A Spanish telephone survey of 2136 women living in the Madrid region showed that unemployment increased physical violence victimisation.<sup>5</sup> Furthermore, secondary analysis of the 2008 British Crime Survey data demonstrated that individual and area social deprivation were associated with being a victim of any IPV among women but not generally among men.<sup>8</sup> Similarly, a systematic review addressing the relationship between violent male partner behaviour and low SEP concluded that more information and better quality data are required to establish conclusive results on the causal role of the socio-economic status of men who batter their intimate partners.<sup>6</sup>

Although bidirectional violence, which means to be both a victim and a perpetrator, is recognised as a common situation in IPV,<sup>11,12</sup> no study has addressed the role of socio-economic indicators in its occurrence. Bidirectional IPV (having been both a victim and perpetrator of at least one act of violence), compared to unidirectional IPV (having been only a victim or only a perpetrator), has been linked with worse health outcomes,<sup>13,14</sup> but rarely measured in samples of adult men and women from the general population. To identify groups that are particularly vulnerable (as those socioeconomically disadvantaged) is of extreme importance for the design of public health interventions.

Thus, the DOVE project ([doveproject.eu](http://doveproject.eu)), a study on IPV in the general population of diverse European cities, provided the opportunity to measure the association between SEP and past year prevalence of physical assault taking into consideration gender and the perspectives of victims, perpetrators and of those involved in violence as both.

## Methods

### Study population

The analysis presented in this article is based on data obtained as part of the DOVE project.<sup>15–17</sup> In brief, DOVE consisted of a cross-sectional multicenter study designed to measure the prevalence, determinants and consequences of IPV using samples of working age adult men and women, 18–64 years, drawn from the general population. For an expected IPV prevalence of 15% and 3.0% of relative precision, the sample size was calculated as 544 (272 women) per centre, and proportionally stratified to follow the age and sex distribution of the resident population (2008 national data). For the purpose of the present investigation, we evaluated participants from Athens–Greece, Budapest–Hungary, Porto–Portugal, Östersund–Sweden, Stuttgart–Germany and London–United Kingdom. Registry-based sampling was used in Stuttgart (city municipality registries, total number of records  $n = 3077$ ), Östersund (state person address registry, number of records  $n = 1996$ ), Porto and London (electoral registry, number of records  $n = 1990$  in Porto and  $n = 4720$  in London) and random-route was performed in Athens and Budapest. In Greece, random route sampling was based on stratification of four major regions of the Greater Municipality Area of Athens according to geographical proximity of municipalities and similar socio-economic structure. At each selected sampling point (building block), households were selected via k-step sampling. At each household, the member who had last his/her birthday was selected. In Hungary, streets were selected from localities in Budapest. A starting address was randomly selected and, taking alternate left- and right-hand turns at road junctions, every  $n$ th address was selected. An adapted Leslie Kish Key was used for participant selection at each household. As complementary sampling strategies, random-digit dialling was used in Porto (number of calls  $n = 10623$ ) and via a public approach in London (potential participants were approached in public settings and invited to

the study,  $n = 1280$ ). Invitation letters with a concise description of the project were sent to participants selected based on registries and the study was presented by the interviewers as part of the invitation procedure to participants contacted through telephone or at their houses.

General information, namely sociodemographic characteristics (sex, age in years and marital status categorised in four groups as single, cohabiting, married and divorced/separated/widowed), was collected by face-to-face interviews except in Östersund where, due to local ethical decision, all questionnaires were mailed to be self-completed and returned using a prepaid envelope. Mailed questionnaires were also predominantly used in Stuttgart (74.5% were mailed in Stuttgart) but were also present in Porto (14.0% mailed questionnaires) and London (3.5% mailed questionnaires). The final sample comprised 3496 participants, 1470 men and 2026 women.

### Ethical considerations

The violence section of the questionnaire was self-administered in all sites and face-to-face interviews performed for the remaining sections of the questionnaire were only conducted if privacy was assured. Where face-to-face contact was possible, a trained interviewer introduced the questionnaire to participants and let them fill it privately. They also provided participants with an envelope where the questionnaire was sealed and returned to the interviewer. The World Health Organization ethical and safety guidelines for the conduct of research on violence against women were followed.<sup>18</sup> Interviewers received instructions for conducting interviews in the presence of the participant alone. If privacy was not ensured, the interviewer would kindly apologise and stop the questioning.

In the case of posted questionnaires, a letter was sent detailing the study objective, the participant's selection procedures and explaining the anonymous character of responses. This letter also included the full names and contacts of the research team (telephone, e-mail), institution, funding agency and project website. The study protocol was approved by local research ethic committees at each city. Signed informed consent was obtained from every participant that provided information by face-to-face interview.

### Intimate partner violence

Past year physical IPV was measured using the physical assault scale (12 items) of the Revised Conflict Tactics Scales (CTS2).<sup>19</sup> Physical assault comprised such acts as throwing something at the partner that could hurt, twist partner's arm or hair, push, shove, grab, slap, punch or hit, choke, kick, slam against a wall, burn or scald on purpose, beat up and use a knife or gun. The severity of violent acts is categorised as 'minor' or 'severe' according to risk of injury that would require medical attention.<sup>19</sup>

Respondents were asked to report their experience as victims and as perpetrators of physical assault regarding a current or former intimate partner. Ever-partnered participants included those in a dating, cohabiting or marital relationship for more than one month. Participants rated the frequency

with which any particular event item happened during the previous year (they are given an eight point answer scale to mark if it happened: never; once in the past year; twice; 3–5 times; 6–10 times; 11–20 times; more than 20 times or if it has happened but not during the previous year), with them as victims or perpetrators. Participants were classified according to the type of involvement reported as victims-only, as perpetrators only, and as both victims and perpetrators if involved in bidirectional violence.<sup>11</sup>

Previously validated versions of the CTS2 were available in Portuguese, German and Swedish.<sup>20,21</sup> For the Greek and Hungarian versions, forward translation, revision by expert panel, back-translation, new expert panel revision and piloting was performed. The internal consistency of the CTS2 (Cronbach alpha) was 0.903 for victimisation (ranging from 0.825 in Budapest to 0.956 in London) and 0.896 for perpetration (ranging from 0.748 in Östersund to 0.953 in London).

### Socio-economic indicators

Information on socio-economic characteristics was self-reported. Three variables were considered to approach SEP:

- educational level, defined according to the International Standard Classification of Education (ISCED).<sup>22</sup> For analysis, the categories considered were: primary or less (ISCED 0 and 1), secondary and upper secondary or equivalent (ISCED 2, 3 and 4), university degree (ISCED 5 and 6);
- occupation, classified using major professional groups, according to the International Standard Classification of Occupations (ISCO-08),<sup>23</sup> and categorised into three groups: upper white collar (groups 1, 2 and 3 of ISCO comprising executive civil servants, industrial directors and executives, professionals and scientists and middle management and technicians); lower white collar (groups 4 and 5 of ISCO comprising administrative and related workers and service and sales workers); blue collar (comprising farmers and skilled agricultural, fisheries workers, skilled workers, craftsmen and similar, machine operators and assembly workers and unskilled workers);
- unemployment duration, measured according to the three answering options offered to the question: How long have you been unemployed totally in your life: never; 12 months or less; more than 12 months?

### Statistical analysis

Data analysis was performed separately for men and women. One-way ANOVA was used to compare means (age), and chi-squared test was used to compare proportions (across levels of socio-economic indicators, marital status, city of residence and type of involvement in physical assault).

Among participants experiencing bidirectional physical assault, a measure of chronicity of abusive acts was computed by adding the midpoints for the frequency categories chosen and summing these acts according to their severity categorisation (minor and severe). The midpoints considered for each answer were: 1, 2, 4, 8, 15 and 25, as suggested by the original scale's author<sup>24</sup> (these correspond to answers once in

the past year, twice, 3–5 times, 6–10 times, 11–20 times and more than 20 times). Within these participants (involved in bidirectional violence), Mann–Whitney U was used to compare the number of minor, severe and total acts of victimisation and perpetration by sex.

Adjusted odds ratios and 95% confidence intervals were computed to measure the association between any act of past year physical assault (regardless of severity) and SEP indicators by fitting multivariate logistic regression models including age, marital status and city of residence as covariates. Models were stratified according to the type of involvement in violence (victims, perpetrators and bidirectional). Tests for linear trend of the log odds were computed for all models. Only participants with complete information were used in the regression models no imputation was made for missing data.

A supplementary analysis was conducted by fitting logistic random effects models with physical IPV as the outcome. A null model was fitted to analyze the city-level variance without considering any SEP characteristic and additional models were fitted to include education, occupation and unemployment duration, adjusting for age and marital status. Interclass Correlation Coefficients were computed to show the percentage of observed variation in physical IPV that was attributable to city-level characteristics. Analysis was performed using the software SPSS, v.21, Stata, v.11 and R, v3.2.4.

## Results

As shown in [Tables 1 and 3](#) 0.5% of women and 4.1% of men were involved in past year intimate physical assault as victims, 10.0% of women and 11.9% of men declared bidirectional involvement, and 4.2% of women and 3.8% of men were involved as perpetrators.

Women involved in IPV were less educated, and both men and women involved in IPV were younger, with less skilled occupations and more often unemployed than subjects not reporting violence involvement. Women and men victims were more often divorced or separated than those not involved in IPV and women and men perpetrators were more often single or cohabiting. The largest proportion of women declaring victimisation-only was found in Budapest (23.9%) and London (22.4%). Bidirectional IPV was more common in Athens (26.9% in women and 46.7% in men) and the largest proportion of women perpetrators-only was observed in Budapest (24.7%). London and Budapest presented the largest male prevalence of victims-only (23.2% and 19.6%, respectively).

Considering the chronicity of acts (number of times each act occurred during the previous year) among participants experiencing bidirectional violence, stratified by acts of victimization and perpetration, women suffered more minor acts of physical assault than men ( $P = 0.005$ ), and no other sex-difference for minor or severe acts was noted ([Table 2](#)).

Compared to those with a university degree, and after adjustment for age, marital status and city of residence, women with primary education only were more frequently involved in IPV as victims-only (adjusted odds ratios, 95% confidence intervals = 3.2, 1.3–8.0), [Table 3](#). Female

involvement in bidirectional violence increased with decreased education (secondary level: 1.7, 1.2–2.5; primary education: 4.1, 2.4–7.1). A significant linear trend for increased violence with decreased education was observed in women involved in bidirectional IPV.

In women declaring perpetration-only, a non-significant increase in risk with decreasing education was observed. Compared to upper white collar workers, women in blue collar occupations were more often victims (2.1, 0.9–4.8), perpetrators (3.0, 1.3–6.8) and involved in bidirectional IPV (4.0, 2.3–7.0). A significant trend was observed for the association between occupational level and perpetration-only and bidirectional IPV.

Compared to never unemployed women, those who had been unemployed for more than 12 months presented increased odds of victimisation-only (2.1, 1.1–4.0) and of involvement in bidirectional IPV (1.8, 1.2–2.7). Compared to single women, those cohabiting (3.1, 1.2–8.2), married (2.7, 1.1–6.4) and those divorced, separated or widowed presented increased odds of victimisation-only (4.6, 1.7–12.3).

Men who had been unemployed for more than 12 months, compared to never-unemployed men presented increased odds of involvement in bidirectional (1.7, 1.0–2.9), and perpetration-only IPV (3.8, 1.7–8.7). No other statistically significant association was found for men.

## Discussion

This multicenter, cross-sectional, European study showed that SEP was associated with the occurrence of physical past year IPV, with disadvantageous social positions being associated with an increased prevalence of physical assault. However, this general pattern does not stand when we consider gender, violence profile and social indicator.

Low education and low occupational status were significantly associated with female victimisation and bidirectional IPV. Unemployment duration was associated with female victimisation, male perpetration and with bidirectional IPV in both the sexes.

The strengths of this study included the analysis of a large population-based European sample of men ( $n = 1470$ ) and women ( $n = 2026$ ) with a common measure of IPV. These particular cities were assessed because of the past experience of the research consortium, whose members are established in these regions.

The different sampling procedures taken in each city may be a source of selection bias, although previous analysis showed that within cities where two different strategies were employed (Porto and London), different sampling procedures resulted in similar characteristics.<sup>15</sup> Refusals data and response rates were not possible to collect. We expected that face-to-face contact in recruitment (as was the case of our Greek, Hungarian, and British participants) or the use of telephone for recruitment (as Portuguese participants) contributed to higher participation rates, when compared with participants only contacted through post (100% in Östersund, and 75% in Stuttgart). Nevertheless, our previous analysis revealed that we interviewed a proportionally more educated sample, compared to the national population in all

**Table 1 – Sample characteristics according to involvement in past year intimate partner violence (physical assault).**

Characteristics		Involvement in intimate partner violence									
		Women					Men				
		No	Victims	Bidirectional	Perpetrators	P	No	Victims	Bidirectional	Perpetrators	P
Age (mean [SD])		43.6 (13.4)	42.8 (11.2)	38.9 (13.1)	36.9 (12.2)	<0.001	43.0 (12.9)	37.5 (12.8)	37.0 (12.7)	38.8 (11.5)	<0.001
Education n (%)	University	720 (46.5)	20 (32.3)	61 (32.1)	34 (42.0)	0.002	471 (43.7)	17 (32.1)	62 (38.0)	14 (28.0)	0.095
	Secondary	708 (45.7)	34 (54.8)	104 (54.7)	39 (48.1)		539 (50.0)	34 (64.2)	93 (57.1)	33 (66.0)	
	Primary	122 (7.9)	8 (12.9)	25 (13.2)	8 (9.9)		67 (6.2)	2 (3.8)	8 (4.9)	3 (6.0)	
	No information	143 (7.1)					127 (8.6)				
Occupation n (%)	Upper white collar	525 (44.1)	19 (35.8)	39 (30.2)	17 (30.9)	<0.001	423 (49.1)	13 (32.5)	33 (26.8)	15 (36.6)	<0.001
	Lower white collar	538 (45.2)	22 (41.5)	58 (45.0)	25 (45.5)		216 (25.1)	15 (37.8)	51 (41.5)	10 (24.4)	
	Blue collar	128 (10.7)	12 (22.6)	32 (24.8)	13 (23.6)		222 (25.8)	12 (30.0)	39 (31.7)	16 (39.0)	
	No information	598 (29.5)					405 (27.6)				
Unemployment duration n (%)	Never	850 (56.4)	28 (45.2)	70 (40.0)	31 (41.9)	<0.001	603 (56.7)	26 (48.1)	71 (46.7)	17 (36.2)	0.032
	≤12 months	402 (26.7)	15 (24.2)	61 (34.9)	29 (39.2)		311 (29.3)	18 (33.3)	52 (34.2)	19 (40.4)	
	>12 months	256 (17.0)	19 (30.6)	44 (25.1)	14 (18.9)		149 (14.0)	10 (18.5)	29 (19.1)	11 (23.4)	
	No information	207 (10.2)					154 (10.5)				
Marital status n (%)	Single	374 (23.5)	8 (11.9)	58 (30.1)	23 (28.4)	0.001	291 (26.3)	20 (35.7)	67 (40.9)	14 (26.9)	0.013
	Cohabiting	234 (14.7)	11 (16.4)	31 (16.1)	22 (27.2)		187 (16.9)	9 (16.1)	22 (13.4)	12 (23.1)	
	Married	736 (46.3)	30 (44.8)	76 (39.4)	23 (28.4)		521 (47.1)	19 (33.9)	61 (37.2)	20 (38.5)	
	Divorced/Separated/	246 (15.5)	18 (26.9)	28 (14.5)	13 (16.0)		108 (9.8)	8 (14.3)	14 (8.5)	6 (11.5)	
	Widowed										
City of residence n (%)	No information	95 (4.7)				<0.001					<0.001
	Athens	200 (12.6)	12 (17.9)	52 (26.9)	9 (11.1)		171 (15.4)	9 (16.1)	77 (46.7)	14 (26.9)	
	Porto	337 (21.2)	9 (13.4)	25 (13.0)	12 (14.8)		196 (17.7)	5 (8.9)	13 (7.9)	3 (5.8)	
	Budapest	284 (17.8)	16 (23.9)	25 (13.0)	20 (24.7)		194 (17.5)	11 (19.6)	23 (13.9)	15 (28.8)	
	London	215 (13.5)	15 (22.4)	33 (17.1)	16 (19.8)		191 (17.2)	13 (23.2)	23 (13.9)	14 (26.9)	
	Östersund	300 (18.8)	6 (9.0)	25 (13.0)	18 (22.2)		183 (16.5)	9 (16.1)	14 (8.5)	2 (3.8)	
	Stuttgart	256 (16.1)	9 (13.4)	33 (17.1)	6 (7.4)		173 (15.6)	9 (16.1)	15 (9.1)	4 (7.7)	
Total n (%)	No information	93 (4.6)					89 (6.1)				
		1592 (82.4)	67 (3.5)	193 (10.0)	81 (4.2)		1108 (80.2)	56 (4.1)	165 (11.9)	52 (3.8)	

P = P-value for one-way ANOVA or chi-squared test; SD = standard deviation.



**Table 2 – Chronicity<sup>a</sup> of acts among participants experiencing bidirectional physical intimate partner violence.**

Violence severity		Victims		Perpetrators	
		Mean (SD)	P <sup>b</sup>	Mean (SD)	P <sup>b</sup>
Women	Minor acts	13.5 (22.1)	0.005	8.3 (13.9)	0.255
	Severe acts	9.2 (21.7)	0.879	4.2 (10.0)	0.199
	Total	22.7 (41.3)	0.059	12.5 (21.3)	0.770
Men	Minor acts	7.6 (12.5)		7.4 (12.1)	
	Severe acts	6.0 (16.4)		5.6 (14.9)	
	Total	13.6 (26.7)		13.0 (24.8)	

SD = standard deviation.

<sup>a</sup> Among participants who engaged in one or more acts of violence in the previous year, we added the midpoints for the frequency categories chosen and summed these acts for each type of violence. The midpoints considered were accordingly: one, two, four, eight, 15 and 25, as suggested by the original scale' author.

<sup>b</sup> The mean number of violent acts were computed according to violence involvement and severity subscales. Mann–Whitney U was used to compare the number of minor, severe and total acts by sex.

centres, and that participants recruited were slightly older than the resident population in Porto, Östersund and Budapest, which might have resulted in an overall underestimation of violence. Besides the variation in disclosure of violence exposure and perpetration that may incur from the different data collection methods used, the influence of culturally determined norms and attitudes towards violence was not assessed. Our models were adjusted for city of residence expecting that the associations between IPV and SEP indicators holds across these heterogeneous societies (from the ones considered more gender-egalitarian such as the Swedish society, to those expected more patriarchal, such as the Portuguese, even if represented by small-sized cities). A drawback of this approach is that we are unable to show regional specificities of the relations explored.

We fitted random intercept logistic models and present them as supplementary material to estimate the percentage of variance in IPV that might be attributable to unmeasured city-level characteristics. The fixed estimates remained essentially unchanged for the three socio-economic position characteristics considered. However, the Interclass Correlation Coefficients as a measure of observed variation in IPV attributable to higher-level features, varied from 0% in the model adjusted for education and unemployment duration among women perpetrators and for the three SEP indicators among men victims, to 47.3% for unemployment duration among men as perpetrators only ([Supplementary Table 1](#)). This result suggests that the percentage of variance in IPV attributable to city-level characteristics varies according to the type of involvement and SEP indicator used. The cross-cultural consistency of the associations explored, despite stressing the need for European-level initiatives to tackle IPV, do not diminish the need for focused national assessments and for cross-regional comparisons.

Focus was exclusively on physical IPV, which, together with sexual violence is one of the most commonly measured types of violence in studies using general population samples.<sup>25</sup> Other types of IPV, sexual or psychological, might be

differently linked to SEP. However, victimisation and perpetration of different violence types (physical, sexual, psychological) may overlap,<sup>26</sup> which increases the difficulty of analysing factors specifically associated with each violence type.

The definition of bidirectional violence used in this study (having been both a victim and perpetrator of at least one act of physical assault during the previous year, at some point and not necessarily at the same occasion as opposed to having been only the victim or only the perpetrator) does not consider the context and motive of violent acts. Hence, there may be different dynamics underlying male and female involvement in violence in these samples that should be further explored, although few sex-differences were noted for the chronicity of acts (number of times each act occurred during the previous year) among those experiencing bidirectional violence. Still, culturally defined gender roles may determine that women put more blame on themselves for their own use of violence even if it happened only once during the previous year in a context of self-defence, while men may disclose a common victimisation and perpetration with more ease. Therefore, we cannot rule out the potential for a reporting bias, particularly for male perpetration reports.<sup>27</sup> Likewise, the lack of perceived support or shame experienced by those in a disadvantaged socio-economic position may also lead to underreporting of violence experiences.

A strength of this study was the use of three indicators of SEP. In the study of inequalities, various indicators are linked to individual proximate determinants of health, thus a single measure of SEP is unlikely to capture adequately its multiple dimensions that may have an independent influence on outcomes.<sup>28</sup> Relatively few studies have compared multiple indicators of SEP simultaneously or in a multivariate analysis in cross-national studies. These results are however difficult to draw firm conclusions from since occupation compositions and educational systems differ across nations. The present study used international classification systems for education and occupations to maximise comparability across nations, even though changes in educational attainment and occupational composition might have differed within European states during the past years.

We did not measure the influence of neighbourhood SEP characteristics on the relation between individual SEP and IPV. The neighbourhood SEP composition has been shown to influence the relation between individual SEP and attitudes towards violence against women in Sub-Saharan Africa,<sup>29</sup> but no influence of neighbourhood SEP characteristics has been found on the risk of IPV against women in Sao Paulo, Brazil.<sup>3</sup> Future studies should measure and test such contextual impact in these European urban centres and also consider other social and cultural characteristics that may play a role in IPV experiences and disclosure, such as religious denomination.

Finally, the cross-sectional nature of this study does not allow drawing inferences on causality. However, two of the indicators used to measure the SEP of participants (which are inherently correlated), may be thought of as preceding past year physical assault once they are acquired by early adulthood (educational level) and are less likely to diminish over time (the social status and power measured by the occupational level).<sup>30</sup>

**Table 3 – Associations (odds ratios and 95% confidence intervals) of past year intimate partner violence (physical assault) and socio-economic indicators, by sex and according to the profile of violence involvement (victims, bidirectional, perpetrators).**

Socio-economic indicators		Victims	Bidirectional	Perpetrators
		AOR (95%CI)	AOR (95%CI)	AOR (95%CI)
<b>Women</b>				
Age		1.0 (1.0–1.0)	1.0 (1.0–1.0)	1.0 (0.9–1.0)
Education	University	1.0	1.0	1.0
	Secondary	1.6 (0.9–2.8)	1.7 (1.2–2.5)	1.2 (0.7–1.9)
	Primary	3.2 (1.3–8.0)	4.1 (2.4–7.1)†	2.0 (0.9–4.7)
Occupation	Upper white collar	1.0	1.0	1.0
	Lower white collar	0.9 (0.5–1.7)	1.3 (0.8–2.0)	1.2 (0.6–2.4)
	Blue collar	2.1 (0.9–4.8)	4.0 (2.3–7.0)†	3.0 (1.3–6.8)†
Unemployment duration	Never	1.0	1.0	1.0
	≤12 months	1.1 (0.5–2.1)	1.4 (1.0–2.1)	1.6 (0.9–2.8)
	>12 months	2.1 (1.1–4.0)†	1.8 (1.2–2.7)†	1.5 (0.8–3.0)
Marital status	Single	1.0	1.0	1.0
	Cohabiting	3.1 (1.2–8.2)	1.1 (0.7–1.9)	1.8 (0.9–3.6)
	Married	2.7 (1.1–6.4)	1.0 (0.6–1.5)	0.9 (0.5–1.9)
	Divorced/Separated/Widowed	4.6 (1.7–12.3)	1.4 (0.8–2.4)	1.6 (0.7–3.7)
City of residence	Athens	1.0	1.0	1.0
	Porto	0.5 (0.2–1.1)	0.3 (0.2–0.6)	1.0 (0.4–2.4)
	Budapest	0.8 (0.4–1.7)	0.3 (0.2–0.6)	1.5 (0.6–3.3)
	London	1.1 (0.5–2.4)	0.5 (0.3–0.9)	1.4 (0.6–3.2)
	Östersund	0.3 (0.1–0.8)	0.3 (0.2–0.6)	1.2 (0.5–2.8)
	Stuttgart	0.5 (0.2–1.3)	0.5 (0.3–0.8)	0.5 (0.2–1.4)
<b>Men</b>				
Age		1.0 (0.9–1.0)	1.0 (1.0–1.0)	1.0 (1.0–1.0)
Education	University	1.0	1.0	1.0
	Secondary	1.8 (0.9–3.3)	1.1 (0.8–1.6)	1.8 (0.9–3.6)
	Primary	1.2 (0.3–5.5)	1.5 (0.6–3.4)	2.9 (0.7–11.4)
Occupation	Upper white collar	1.0	1.0	1.0
	Lower white collar	2.1 (0.9–4.8)	1.7 (1.0–2.9)	0.9 (0.4–2.2)
	Blue collar	1.8 (0.7–4.3)	1.4 (0.8–2.5)	1.4 (0.6–3.0)
Unemployment Duration	Never	1.0	1.0	1.0
	≤12 months	1.2 (0.7–2.3)	1.3 (0.9–2.0)	2.1 (1.0–4.3)
	>12 months	1.8 (0.8–3.9)	1.7 (1.0–2.8)	3.8 (1.7–8.7)†
Marital status	Single	1.0	1.0	1.0
	Cohabiting	0.7 (0.3–1.9)	1.1 (0.6–2.0)	2.2 (0.9–5.3)
	Married	0.9 (0.4–2.0)	1.0 (0.6–1.7)	1.3 (0.6–3.1)
	Divorced/Separated/Widowed	1.9 (0.7–5.3)	1.4 (0.7–2.8)	1.6 (0.5–4.9)
City of residence	Athens	1.0	1.0	1.0
	Porto	0.6 (0.2–2.0)	0.2 (0.1–0.3)	0.2 (0.1–0.7)
	Budapest	1.1 (0.5–2.9)	0.3 (0.2–0.4)	0.8 (0.4–1.8)
	London	1.3 (0.5–3.2)	0.3 (0.2–0.4)	0.8 (0.3–1.7)
	Östersund	1.5 (0.5–4.1)	0.2 (0.1–0.4)	0.1 (0.0–0.5)
	Stuttgart	1.2 (0.5–3.2)	0.2 (0.1–0.4)	0.3 (0.1–0.8)

AOR = adjusted odds ratio (95% confidence interval).

Marital status, age and city of residence were included in all adjusted models.

† P-value for trend in AOR statistically significant ( $P < 0.05$ ).

The results we obtained among women are in line with the evidence linking lower educational levels with female physical assault victimisation.<sup>10</sup> Although clarity on which mechanisms explain the relation is still needed, higher levels of schooling seem to improve individual's ability to obtain and effectively use information, improves decision-making and problem-solving skills, including motivation, persistence and self-control and the ability to cope with stressful life events.<sup>31</sup> Thus, for women involved in violence, education facilitates their escape from violent relationships and help-seeking.<sup>32</sup>

Regarding marital status, our results are in line with previous studies suggesting that the partner's status, and particularly for women, having a former partner status, may be a significant determinant of physical violence victimisation.<sup>7</sup>

Less evidence exists linking occupational class and physical assault.<sup>6</sup> Earlier perspectives root IPV in societal patriarchy and the social power imbalance observed between men and women would be one of the main determinants of male-to-female IPV.<sup>4</sup> Violence as a compensatory behaviour to make up for men's lack of power in other areas of life such as in his occupation<sup>33</sup> would explain higher battering rates in men with

less skilled occupations. In our results, only in women, was the association between IPV and occupation evident particularly for those declaring bidirectional IPV or perpetration-only, which might be the result of different mechanisms that operate among these western European urban women.<sup>34</sup>

Male unemployment has also been documented as a risk factor for physical violence against women.<sup>6,7</sup> The stress associated with unemployment may increase the risk of violence, but it may also be hypothesised that unemployment is a consequence of abuse present in both sexes, even though unemployment has been suggested as more detrimental for men than women and directly linked to the mechanism of male social approval and status production.<sup>35</sup>

With the increasing awareness to gender equality that have marked European societies for several years,<sup>36,37</sup> it is possible that women are gaining increasing power in roles typically occupied by men, in social, political and economic areas, thus the shift in gender roles may include violent acts in intimate relationships,<sup>38,39</sup> with women being affected by the same power seeking mechanisms thought to explain male's dominance,<sup>12</sup> except in the case of unemployment, that may still affect more profoundly male's subjective well-being,<sup>35</sup> facilitating his use of violence.

More broadly, the relation of IPV and SEP is congruent with the established knowledge from social epidemiology linking other types of interpersonal violence (violent crime, homicide), with inequality.<sup>40</sup> Socially disadvantaged people compete more for social status and social respect, and physical violence, therefore, is more frequently used in the struggle for social resources.<sup>1</sup> Our results are also consistent with studies documenting male use of controlling behaviours and dominance as main determinants for their perpetration in male-to-female IPV.<sup>41</sup> The female perpetration observed, is in line with studies reporting gender equivalence in risk factors for IPV perpetration,<sup>42</sup> even though motives for female perpetration may be different (e.g. self-defence).

Bidirectionality of IPV, and in particular, of physical acts of violence, is frequent and disproportionally present among European adults characterised by a disadvantaged socio-economic position. EU policy makers are already aware and taking action over health inequalities and the socio-economic determinants of health but should also consider experiences of IPV as an additional source of susceptibility among those considered most vulnerable.

## Author statements

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### Ethical approval

The study protocol was approved by local Research Ethic Committees at each city. Signed informed consent was obtained from every participant that provided information by face-to-face interview.

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### Competing interests

None declared.

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## Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.puhe.2016.05.001>.